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# **GIS Technology Strategy for Indiana**

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Prepared by:  
Indiana Geographic Information Council, Inc.  
November 11, 2004

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## EXECUTIVE SUMMARY

### Purpose of this Document

This white paper recommends a strategic direction for Indiana geographic information systems (GIS). It is intended to be a reference during Indiana government restructuring and the drafting of GIS legislation. The objective is to develop and maintain a seamless, consistent GIS base map for economic development, homeland security, and other mission-critical applications. That base map, referred to as the “IndianaMap” will be accessible among multiple levels and jurisdictions of government, public, and GIS users. The result will save tax-payer dollars and improve government efficiency. It will reduce redundant efforts, maximize economies of scale, and enable interoperable systems that can communicate with each other.

GIS technology can be used strategically as a decision-making tool in areas such as:

- |                          |                         |                            |
|--------------------------|-------------------------|----------------------------|
| • agricultural resources | • facilities management | • public health and safety |
| • commerce               | • forestry              | • site selection           |
| • cultural resources     | • geology               | • social services          |
| • e-911                  | • homeland security     | • taxation and revenue     |
| • economic development   | • land resources        | • transportation           |
| • education              | • natural resources     | • utilities                |
| • emergency management   | • local government      | • waste management         |
| • environmental          | • planning              | • water resources          |
| management               | • property assessment   | • wildlife                 |

Increasingly complex decisions, overlapping responsibilities and limited financial resources demand the statewide coordination of investments, practices and policies related to geographic data and GIS technologies. Through coordination, it is possible to enhance the sharing and stewardship of geographic data, minimize effort and public expenditure, and boost economic development.

This white paper recommends a comprehensive GIS Technology Strategy which leverages our human, technical and financial resources. The strategy encompasses the following:

- IndianaMap Framework Data Program (base map)

- Geographic Information System Office and GIS Advisory Board
- Participation of major universities in method development, instruction, and relationships with local governmental units
- Local Government GIS Technology Grants

The strategy is cost effective and meets the needs of its most demanding users – local government. It recognizes that all levels of government (federal, state and local) have a role in supporting and maintaining Indiana’s collective GIS resources. It strategically leverages new, existing and future GIS investments at each level of government, and builds capacity where it is lacking.

The assessment by the Indiana Geographic Information Council (IGIC) of the annual costs to implement and maintain a comprehensive GIS Technology Strategy is \$6,400,000. IGIC recommends that the budget be phased in over three years while taking advantage of available homeland security grant funding for GIS during 2004 and 2005.

### **Why a GIS Technology Strategy?**

**Because** at an enterprise level, our existing approach to GIS technology statewide implementation is broken. Today, Indiana is unable to realize the vast benefits of a comprehensive GIS. We lack a base map that is statewide, seamless, accurate, and accessible. And because of independent or isolated government business models (supported by provisions for GIS data in the Indiana Public Access Code), we often cannot easily share mission-critical data among neighboring jurisdictions or among different levels of government. Existing data are not consistently available for applications that affect the health, safety, welfare, and economy of Indiana citizens.

**Because** disasters cross boundaries; economic development is regional; highway planning is multi-jurisdictional; criminals and sex offenders change addresses; and emergency responders provide mutual aid response to neighboring jurisdictions.

**Because** a complete count of residents in the 2010 Census can ensure Indiana gets its fair share of federal funds – each person counted brings close to \$400 per person to every community and helps retain our congressional delegation at ten seats (based on research by the IBRC).

**Because** lack of data integration often results in duplicative mapping and system development costs. In other words, the same location is mapped at one scale for one purpose (e.g., farmland protection), and again at another scale for a different project (e.g., new highway design). In addition, file formats and software differences may inhibit data sharing.

The Indiana GIS Technology Strategy adheres to the principle “Build once, use many times.” It is an example of how statewide coordination of GIS can benefit the State, local government, and citizen’s of Indiana. Coordinated base map projects (like the 2005 Statewide Orthophotography Project) demonstrate economies of scale with savings of 20-40% while achieving the objectives of the GIS Technology Strategy. The strategy demonstrates cost savings, support of mission-critical projects, multi-jurisdictional coordination, consistent standards statewide, shared funding, partnerships, bridging the digital divide, educational opportunities, and positive economic impact.

## INTRODUCTION

In the past decade, governmental agencies, educational institutions and private industry have developed increasingly powerful computer systems designed to process and analyze map and other spatial information, collectively called GIS technology. Coordinating efforts at both programmatic and project levels is critical for effective GIS applications and to eliminate duplication of effort between agencies and jurisdictions. This duplication of effort is a systemic problem for GIS in government, as documented by the following report from a technology subcommittee hearing of the United States Congress - Committee on Government Reform held on June 23, 2004.

<http://reform.house.gov/TIPRC/Hearings/EventSingle.aspx?EventID=1150>

To ensure effective coordination and appropriate funding, a clear authority is required. To this end, the following recommendations are offered:

- The creation of a State GIS Advisory Board chaired by the Lieutenant Governor. The Board will make policy recommendations and provide guidance to the GIS Office.
- An existing or a newly-created State office will be given statutory authority to evaluate and implement the recommendations of the GIS Advisory Board. It will have the ability to foster collaborative GIS efforts among federal, state, and local jurisdictional entities.
- Universities, private contractors, and other organizations have demonstrated exceptional GIS capabilities. Their contribution to and participation in a state GIS program is essential to its success. The state GIS program should, therefore, promote collaboration with these entities whenever possible.

Many parts of a coordinated Indiana GIS program will best be provided by agencies outside state government. Current capacity exists in Indiana's State universities, private contractors, and non-profit organizations.

IGIC is a non-profit organization formally recognized by the State and actively engaged in statewide GIS coordination efforts. IGIC develops and recommends policies, standards, guidelines and strategies that emphasize cooperation and coordination among Indiana GIS users, federal agencies and other states that are developing and implementing geographic information systems, in order to maximize the value and cost-effectiveness of geographic data and technologies and to avoid redundant activities. IGIC is an effective statewide coordinating organization and is key to the success of this GIS Technology Strategy.

IGIC conducted an Issues Assessment to identify the most pressing concerns for GIS in Indiana. GIS users were presented with twenty-one issues, including concerns surrounding GIS use, GIS application areas, reported problems with GIS, and challenges that GIS users may face. Here are the top 5 issues identified by the respondents:

1. Sharing GIS data and structures across counties (e.g. interoperable platforms, coordinate systems, addresses, GIS layers)
2. Maintaining up-to-date parcel/property ownership maps

3. Emergency planning and response for homeland security and natural disaster purposes (security, disaster mitigation, business recovery, continuity of government, etc.) including:
  - a. Disaster planning, mitigation, and response (e.g. evacuation route and wind plume information, locating chemical spills and contamination sources in hydrography and sewers)
  - b. Public safety mutual aid (e.g. information about road networks, addresses, civil boundaries, aerial photography, and parcel information)
4. Utility coordination (e.g. locate utility infrastructure, share information about utility company infrastructure)
5. Obtaining high resolution of orthophotography

## THE CHALLENGE

*"Information technology is one of the most powerful tools used by state governments to serve their citizens." Cathilea Robinett, Center for Digital Government.*

To be effective, Indiana's GIS framework and technologies must be seamless (across the state and at all levels of government), available, accessible, current, relevant, comprehensive, interoperable, and managed strategically. Because opportunities for leveraged investments exist within free enterprise, a relatively small investment could easily be grown to address the collective GIS needs of the state.

Twenty-nine states have offices responsible for GIS technologies. And our neighbors are gaining a competitive edge. For example:

- Ohio's GIS Office is aggressively pursuing the Ohio Location Based Response System (LBRs), a multi-jurisdictional statewide GIS asset to help ensure rapid response to natural and man-made disasters.
- Kentucky's Office is far ahead on The Commonwealth Map, a twelve layer statewide digital base map available free via the Internet for interactive mapping and geographic data querying and downloading.
- Michigan is attracting business to its state through Map Michigan and its strong support of the Michigan Geographic Framework.
- Illinois was recognized as the national leader in GIS and Transportation by the Center for Digital Government (2002).

While these states continue to provide nationally recognized services to their respective GIS communities, Indiana is currently in the position to do as well or better than its neighbors (note there are already projects underway beginning to build the "IndianaMap"). We are at the cusp of ground-breaking GIS program development that minimizes costs and ensures that opportunities are leveraged to benefit all levels of government. But success depends on consistent, long term support. To remain competitive, Indiana will have to vigorously adopt a comprehensive GIS Technology Strategy.

## **THE SOLUTION**

A GIS Strategy should be implemented that is comprehensive, well-supported, and far-reaching. The solution outlined below is consistent with the State GIS Coordination Model recommended by the National States Geographic Information Council, and adheres to the principle “build once, use many times” of the National Spatial Data Infrastructure (Federal Geographic Data Committee). IGIC endorses this principle.

The solution must be cost effective and meet the needs of its most demanding users – local government. It must recognize that all levels of government (federal, state and local) have a role in supporting and maintaining our collective GIS resources. It must strategically leverage new, existing and future GIS investments at each level of government, and build capacity where it is lacking.

### **INDIANA GIS STRATEGY – A COMPREHENSIVE SOLUTION**

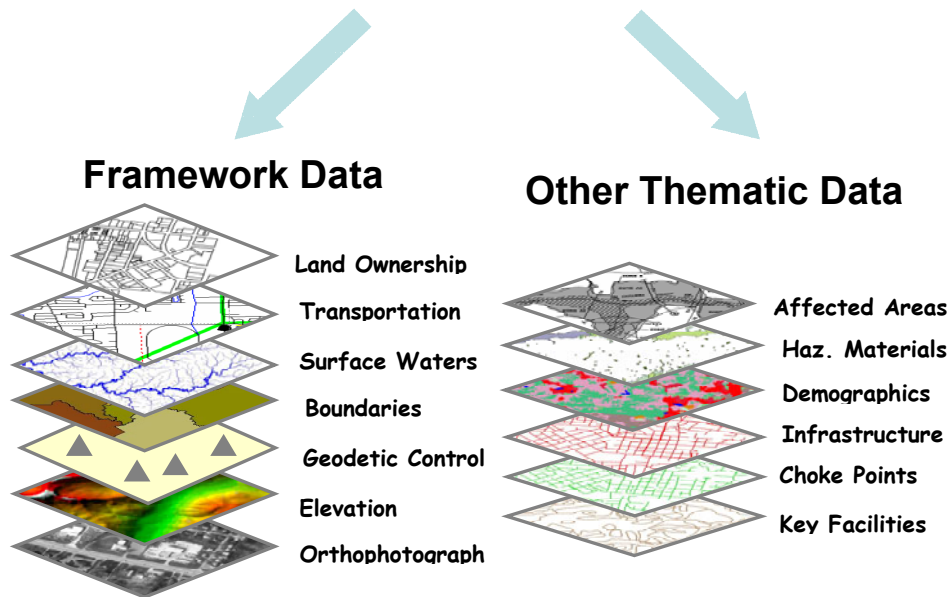
The strategy encompasses the following:

- IndianaMap Framework Data Program (base map)
- Geographic Information System Office and GIS Advisory Board
- Involvement of the major universities in method development, instruction, and linkages with local governmental units
- Local Government GIS Technology Grants

#### **IndianaMap Framework Data Program**

A GIS data infrastructure consists of “framework” data that provide a common base map for other data and applications. This assures that data developed for specific needs will fit together. Mission critical activities use these framework data locally, regionally, statewide, and even nationally. By “building once and using many times,” costs and duplication of effort are reduced or eliminated. Framework data should be public domain datasets and broadly accessible. Proper and complete documentation of framework data using the most current version of the Content Standard for Digital Geospatial Metadata (Federal Geographic Data Committee) will be a requirement.

## Indiana Framework Data Build Once, Use Many Times

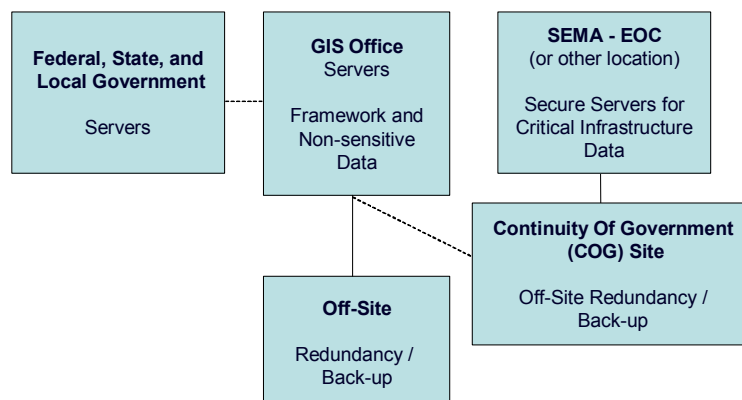


Each framework dataset has different data maintenance requirements. Therefore, framework datasets are best maintained by a number of agencies and levels of government.

Some datasets, like digital orthophotography (aerial photography), are so fundamental to everyone's needs that they can be centrally acquired and managed for everyone's benefit. Central acquisition and maintenance of such datasets can be an efficient approach. Program-specific datasets, however, should remain the responsibility of their respective agencies. In addition, datasets which are updated frequently are often maintained at the local level by a diverse base of data stewards (e.g. counties). While they are appropriately maintained by local government, we must be able to "stitch" these datasets together to form a statewide version of the dataset.

An architecture to support this is illustrated below. The GIS technology architecture will accommodate both publicly accessible data as well as sensitive and critical infrastructure data.

## GIS Technology Architecture



The following list defines the framework data and suggests the appropriate data stewards for each. In order to efficiently maintain and fund a statewide framework data program, data stewards should be formally defined.

1. **Geodetic Control** - system of monumented and GPS survey points; this dataset is under the authority of the State Geodetic Advisor, and monuments are maintained by County Surveyors. A system will be supported that allows for electronically compiling local geodetic control data to create a statewide dataset. IGIC and the County Surveyors have a joint Geodetic Control Workgroup that has been researching ways to accomplish this. County Surveyors will be the stewards of this dataset.
2. **Orthophotography** – aerial photography that is enhanced to have the properties of a map. The GIS Office will be the official data steward for this dataset, and be funded to support its maintenance for a minimum base product (1-foot resolution; 2.5' accuracy) on a 3-year rotational cycle. Local and federal government will have the option to provide matching funds for additional buy-up to higher resolutions and/or additional data products. IGIC has an Orthophotography Workgroup with strong local government participation. This model is supported by the IGIC Workgroup and is being implemented in the 2005 Statewide Orthophotography.
3. **Elevation** - elevations of land surfaces and the depths below water surfaces. The GIS Office will be the steward for this dataset, and be funded to support its maintenance for a minimum base product (5-foot contours). Currently, a low accuracy elevation dataset is available statewide. A few counties have developed high accuracy elevation using "Lidar" technology. A recommendation will be made as to the appropriate steward and update frequency of this framework dataset.
4. **Transportation** - includes roads, trails, railroads, waterways, airports and ports, bridges and tunnels, and addresses. The Indiana Department of Transportation and its local partners (MPO's) will be the official stewards of the transportation datasets. Address data may be an exception to this. A system will be developed that incorporates common standards, data base structures, and data sharing capabilities to allow local maintenance of a statewide data set. Currently, INDOT and the Indiana State Department of Health are working on a pilot project for a statewide centerline with address dataset. The GIS Office may be the appropriate steward of the statewide version of the address dataset. A recommendation will be made as to the appropriate stewards of an address dataset, both locally and at the State.
5. **Surface Water** (Hydrography) - includes surface water features such as lakes, ponds, rivers, streams, canals, flood planes and shorelines. These data are available statewide at different accuracies in different areas of the state. The US Geological Survey currently works closely with the Indiana Department of Natural Resources to update and maintain these data. IDNR will be the official data steward for these data, and a mechanism will be developed to accept updates from local government users.
6. **Boundaries** (Governmental Units) - units of government including the state, counties, incorporated places, and legal civil divisions. The Indiana Geological Survey (IGS) has developed a Public Land Survey System (PLSS) dataset that encompasses state, county, and survey township boundaries. IGIC has recognized this work as "official framework." IGS will be designated as the official steward of these data and as such, funding support will be provided to maintain and upgrade the accuracy of these data. While changes in incorporated places and legal civil divisions occur locally, there is no well-defined



steward for these datasets. A recommendation will be made as to the appropriate steward of the incorporated places and legal civil division framework data.

7. **Land Ownership** (Cadastral Information) - past, current and future rights and interests in real property. Includes surveys, legal descriptions, parcels, and cadastral reference systems like PLSS, and publicly administered parcels (e.g. military, state parks, etc.). The State Land Office maintains state land ownership data, but not currently in digital form. IDNR maintains a dataset of state-owned recreational facilities, and the Department of Transportation maintains INDOT state-owned properties. Counties maintain cadastral data, which may or may not be in a GIS-ready format (varies by county). A system will be developed that incorporates common standards, data base structures, and data sharing capabilities to allow State and local maintenance of a statewide data set. IGIC has a Cadastral Workgroup and a Data Standards Committee, both of which are working on cadastral issues. At a minimum, IGIC recommends a core cadastral GIS dataset of parcel lines and parcel identification numbers (PINs) be maintained and broadly accessible as a public domain dataset. It will be determined if additional attribute data (such as owner name and property value) should be readily accessible to the public on a statewide basis. These data will be readily accessible for government applications at all levels.
8. **Other Priority Data** - IGIC has identified other priority data that are commonly used, like soils, geology, building footprints, utilities, land use and critical infrastructure. The GIS Office will work in cooperation with IGIC and its partners to develop plans for other priority data.

We propose that framework data sets (to be prioritized in the Annual GIS Plan) be managed and funded as a strategic Framework Data Program. In particular, digital **orthophotography should be maintained as an on-going program** managed by the GIS Office. Through homeland security grant funding, orthophotography will be acquired for the entire state in the spring of 2005. IGIC recommends that the state be divided into thirds as annual lots to be flown on a rotational basis beginning in the early spring of 2007. Using this formula, every community in the state will receive an update to this critical base map layer every three years.

The above Framework Data Program demonstrates much efficiency. The 2005 Color Orthophotography Project is a model for how statewide coordination of GIS can benefit the State, local government, and citizen's of Indiana:

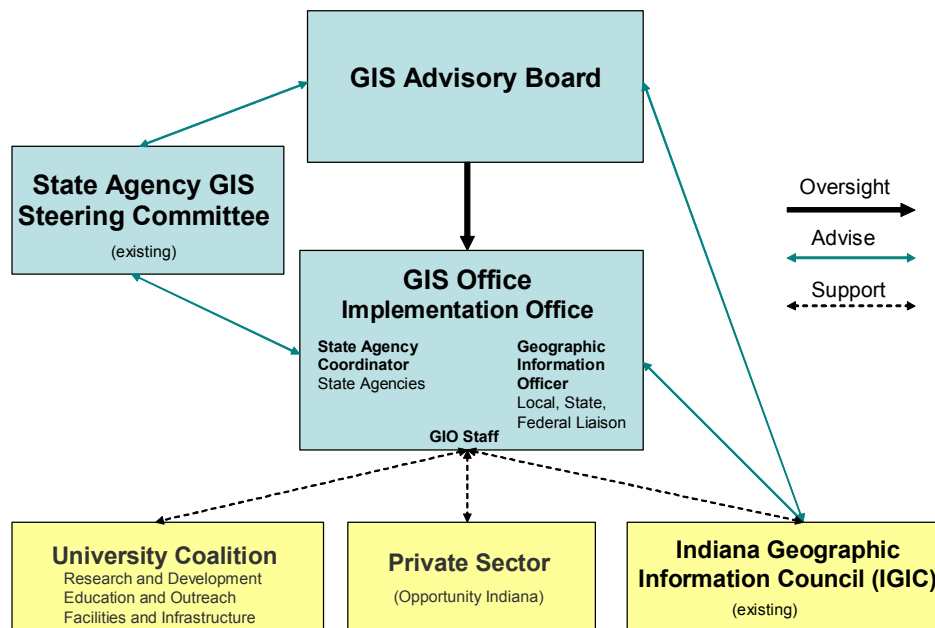
- **Cost Savings** - By doing as a statewide project, the 2005 Color Orthophotography Project will save as much as 30-40% over what it would cost counties individually
- **Multi-Jurisdictional Coordination** - Local and state government, surrounding states and region, federal programs that impact the state
- **Consistent Standards Statewide** - Data fit together
- **Principle of "Build Once, Use Many Times"** - Same framework data available to all for cross-functional applications (homeland security, emergency management, economic development, environmental, e-911, Flood Insurance Rate Map modernization, Census data modernization, GASB-34, etc.)
- **Shared Funding** - Funding from state and local homeland security grants, state agency programs, local government contributions, private utilities, in-kind contributions

- **Partnerships** - Project developed in partnership with local, state and federal government, university, private sector, surveyors, and regional planning organizations
- **Bridging the Digital Divide** - Brings quality GIS base map data to every county, even those that couldn't afford it previously
- **Educational Opportunities** - Outreach statewide to introduce community leaders to the capabilities of the technology; complimentary youth education projects introducing k-12 students to the rapidly growing GIS technology sector
- **Economic Impact** - Stimulates the GIS services sector in Indiana (a growing information technology sector)

### Geographic Information System Office

IGIC recommends the establishment of a State GIS Office. Working with its partners in government, universities, and the private sector, IGIC has built consensus around the principles that will be incorporated into a GIS Office.

## Proposed GIS Structure in Indiana



### ADMINISTRATIVE STRUCTURE OF GIS OFFICE

Administratively, IGIC recommends the GIS Office be placed within a service-based agency (operations, administration, information, or technology).

### GIS OFFICE STAFFING

We envision a small core staff dedicated to the advancement of Indiana's GIS vision and initiatives. We propose all GIS Office staff be full-time, and consist of existing state government

employees, permanent new hires and/or limited-duration contract employees from private industry. This recommendation is based on current funding available for staffing, and the need to launch the office as quickly as possible. The intent is not to centralize all state GIS functions. In fact, the power of GIS is best leveraged when it is combined with programmatic expertise. Therefore, GIS staff from existing state agencies should remain in those agencies and work cooperatively with the GIS Office staff.

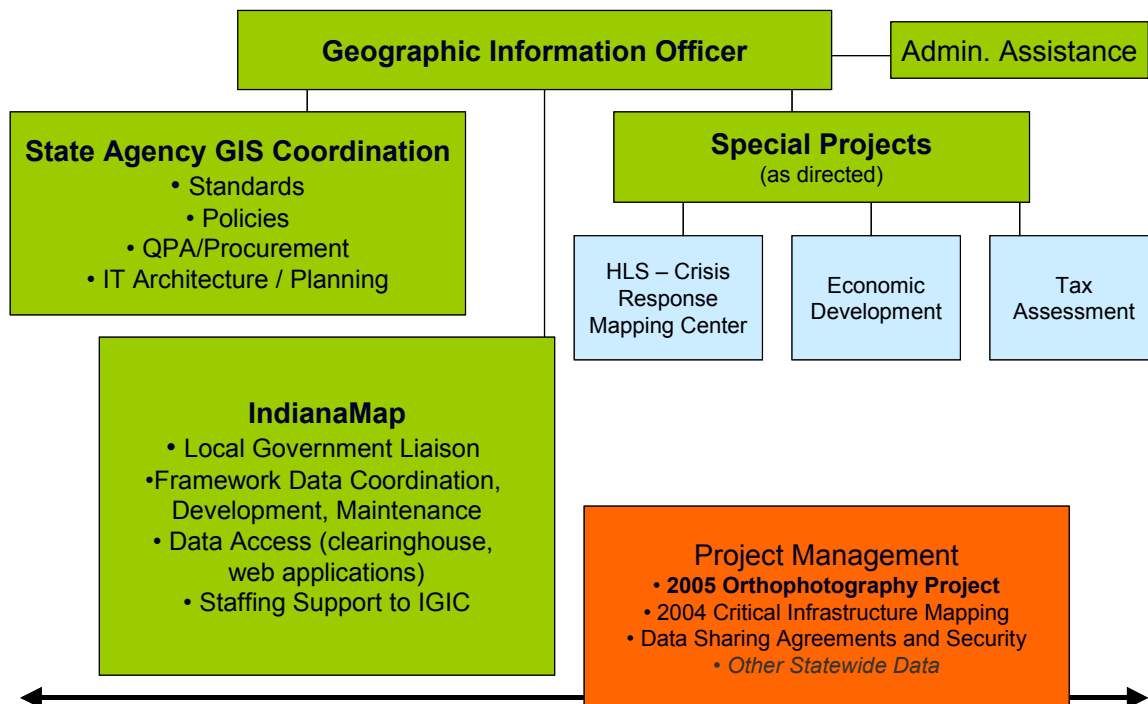
## GIS OFFICE DUTIES

The following describes the duties envisioned for the GIS Office:

1. The GIS Office may solicit, receive and consider proposals for funding from any state agency, federal agency, local government, university, non-profit organization, or private person or corporation. The office may also solicit and accept money by grant, gift, bequest, legislative appropriation, or other conveyance. The office may enter into contracts for services with any state agency, federal agency, local government, university, non-profit organization, or private person or corporation.
2. The GIS Office:
  - a. may work with IGIC to support the functions of statewide GIS coordination;
  - b. shall maintain a statewide GIS inventory of current and planned geographic information systems, framework data, applications, information on grants available for the acquisition or enhancement of geographic information resources, and a directory of geographic information resources available within the State or from the federal government;
  - c. may administer GIS grant programs for local governments or other governmental units to establish and maintain geographic information systems as such programs may be established from any legislative appropriation, state agency, federal agency, local government, university, non-profit organization, or private person or corporation;
  - d. may coordinate multi-agency and/or multi-jurisdictional GIS projects, including the development and maintenance of statewide framework data layers associated with a statewide base map (orthophotography, cadastral, transportation, elevation, surface water, geodetic control, and boundaries);
  - e. may maintain multi-agency and/or multi-jurisdictional data sharing agreements for framework data and other GIS data that may or may not be subject to public information;
  - f. shall provide high-level assistance and advice to state and local agencies in developing and improving GIS capacity, including the development and maintenance of multi-agency and/or multi-jurisdictional statewide geographic information systems in cooperation with other agencies;
  - g. may in cooperation with other agencies, evaluate, participate in pilot studies, and make recommendations on GIS hardware and software;
  - h. may prepare funding proposals for grant opportunities that will further coordinate and expedite implementation of geographic information systems;
  - i. may collect and distribute fees for the Geographic Information Fund;
  - j. shall advise on data sensitivity issues so that information is available to the public while protecting needed confidentiality;

- k. shall deliver a statewide plan and annual report of the GIS Office to the Governor's Office, the Geospatial Information Technology Board, the Chief Information Officer, and the Technology Committees of the State Legislature;
  - l. may act as a liaison, coordinator and representative of the State as an ex officio member of IGIC;
  - m. shall represent Indiana's interests in communications and discussions with federal agencies regarding spatial data, cost-leveraging opportunities, spatial data exchanges, spatial data standards and other important issues.
3. A non-reverting account will be established, referred to as the "Geographic Information System Fund." The purpose of the GIS Fund is to allow the GIS Office to administer grant programs for local agencies or other governmental units, receive funding or grants, administer contracts for services, and to share the revenues with those entities that require reimbursement.

## GIS Office



### Geographic Information System Advisory Board

A GIS Advisory Board will be established to be responsible for oversight of the GIS Office mission, finances, policy support, and strategic direction. The Board, chaired by the Lieutenant Governor, will be comprised of 16 members:

- (2) State Agency Commissioners
- (2) Indiana Senate
- (2) Indiana House of Representatives
- (2) University GIS Consortium
- (2) Representatives of Local Government
- (3) Indiana Geographic Information Council, Inc.
- (2) Commercial GIS Service Providers

IGIC or the GIS Advisory Board will also act in the capacity of the State Geographic Names Authority. There are 51 State Names Authorities (and equivalents); 49 States, 1 Commonwealth, and 1 Territory. Indiana is the only State without what USGS terms generically as State Names Authority (SNA).

### **University GIS Consortium**

The State Universities in Indiana represent a unique resource for GIS academics and practitioners, giving Indiana a competitive advantage. Each of the five, four-year State Universities - Indiana (IU), Purdue (PU), Indiana State (ISU), Ball State (BSU), and University of Southern Indiana (USI) - bring a unique set of skills, research interests and assets to this endeavor. Preliminary contact with each of these universities has indicated a high level of interest and excitement about forming a university-based GIS Consortium for Indiana. Working to advance GIS technology throughout the state, the Consortium would help propel Indiana into a nationally recognized leadership role.

By capitalizing on existing personnel and resources, the effort can be extremely cost effective. It will require a relatively modest budget to provide some base funding for each of the participating universities, and monies to support education, research and outreach efforts. This base funding should be a legislated appropriation earmarked to operate the Consortium.

The purpose of the Consortium will be to support the missions of IGIC and the GIS Office. Tasks will include:

- Maintaining an inventory of university faculty, skills and research interests.
- Assisting the State GIS Office. The GIS Office may need help to collect and distribute GIS data from local governments and provide technical assistance. This will be structured to minimize university competition with the private sector; and ideally in a way which stimulates the market for private sector GIS activities.
- Defining research questions and cooperative research opportunities.
- Collaborative grant submittals.
- Sharing technical capacity (data storage, computing, networking, receivers, etc.).
- Sharing data and publicizing research results which could benefit the state. It will be especially valuable to bring academic understanding to the practical application of state and local government.
- Promoting formal (and seminar-based) GIS education available in our universities. IGIC recommends advertising GIS education opportunities throughout the state, and around the world, for potential students.

Support from the Consortium will focus on the traditional threefold mission of universities: education, research, and service.

### **Education**

The Consortium will promote formal GIS education opportunities to users and students throughout the state. Students can benefit from increased opportunities for internships. Through a series of seminars that take advantage of the many regional campuses around the state, the Consortium will reach out to an ever-growing audience of individuals and

organizations that can benefit from GIS in their daily business. By doing so, the Consortium will help Indiana develop its own cadre of GIS professionals.

### **Research**

The Consortium will coordinate research assets for the benefit of the state. The Consortium will work with state and local governments and IGIC to develop research supporting more effective use of GIS data. It will maintain inventories of the universities' academic and technical experts, data and technology resources, and research interests.

It will also assist state and local governments and other users in the analysis and interpretation of spatial data. Sharing data, research agendas, research facilities, and applications will help position Indiana universities to participate at the highest levels of research nationally and internationally, with benefits accruing directly to the state and its interests.

### **Service**

The Consortium will implement a much needed outreach system for local government throughout Indiana. The system will provide easy access to GIS expertise for all counties, especially for those that lack the resources to make GIS a part of their internal operations. The relationships established and maintained through this outreach will greatly enhance communication between state and local government and increase the level of understanding of each other's needs. This system will go a long way toward promoting the kind of data sharing protocols from which everyone will benefit. It will be necessary for the Consortium to have clear legislative guidelines to ensure that these relationships will not be unfairly used to capture business opportunities that might otherwise go to the private sector.

The Consortium will also work directly with Indiana's GIS business community to help develop and promote Indiana in a leadership role, increase technology capacity, and increase GIS-related job opportunities. The Consortium will ensure that Indiana's private sector benefits from new university research and development. This will be achieved through public/private partnerships, and by providing access to emerging technology, standards and best practices that can provide a competitive advantage to Indiana businesses. The Consortium will collaborate with State initiatives and the GIS business community to help grow more high-tech jobs in Indiana, as well as increase the number of women and minorities who are prepared to enter the field.

### **Local Government GIS Technology Grants**

The majority of highly accurate GIS data are built and maintained by local government. Local Government GIS Technology Grants will build capacity and augment existing systems, and can be used to integrate/update legacy systems and adopt data standards. Supporting local government systems supports the comprehensive development of a statewide system.

The GIS Office, GIS Advisory Board, and IGIC will work together to develop the model for appropriation of grant funding. The Annual GIS Plan, developed in partnership with IGIC, will define short and long-term goals, program priorities, and the criteria for which local governments could use grant funds. This strategy will assure flexibility in meeting local government needs, while working collectively to meet common goals.

The Local Government GIS Technology Grants will be coordinated through the GIS Office. In some cases, the GIS Office may delegate responsibility to another agency to manage GIS Technology Grants that are inside their mission (e.g., GIS for economic development, resource management, public safety, etc.).

## BUDGET

IGIC's assessment of the annual costs to implement and maintain a comprehensive GIS Technology Strategy is \$6,400,000. This budget, presented below, is consistent with well supported GIS technology programs in other states.

Budget Categories	Annual Budget	Phased Budget		
		2005	2006	2007 and after
<b>IndianaMap Framework Data Program</b>				
Priority: 1" orthophotography 1/3 state per year rotation	\$2,300,000	\$0	\$2,300,000	\$2,300,000
Additional Framework Data & Critical Infrastructure data development, maintenance, coordination, and/or data delivery	\$1,000,000	\$0	\$500,000	\$1,000,000
<b>University Consortium</b>	\$500,000	\$150,000	\$300,000	\$500,000
<b>GIS Office</b>	\$1,200,000	\$200,000	\$600,000	\$1,200,000
<b>Local Govt GIS Technology Grants</b>	\$1,400,000	na	\$700,000	\$1,400,000
<b>Total:</b>	<b>\$6,400,000</b>	<b>\$350,000</b>	<b>\$4,400,000</b>	<b>\$6,400,000</b>
blue = budget supplemented by HLS grants				

Note: Orthophotography data collection is grant funded during 2005 and not recommended during 2006. However, to successfully leverage funding the program, orthophotography funding must be in place prior to 2007. Additionally, the GIS Office budget for hardware/software and custom applications is reduced during 2005 and 2006 due to homeland security grant support for these items.

The following examples are of other state GIS Offices' 2001 budgets (note these **do not** include local government grants, or the University Consortium). The IGIC recommended budget recommendations excluding these items is \$3,500,000.

Wisconsin	\$3,140,000	N. Carolina	\$2,000,000
Utah	\$2,650,000	Minnesota	\$1,475,000
Texas	\$3,420,000	Michigan	\$3,000,000
Tennessee	\$5,000,000	Kentucky	\$1,270,000
Oregon	\$2,300,000	Arkansas	\$1,363,000

In recent years, states like Virginia, New York, and now Indiana have invested additional dollars in framework data programs and projects such as statewide orthophotography.

## FUNDING MODELS

Funding models from similar programs in other states have been evaluated. The best funding sources provide a dedicated, continuous stream of revenue, often in perpetuity. Property transfer fees are well acknowledged as the key source of funds for the Wisconsin Land Information Program (WLIP), but statewide GI/GIT efforts are also conducted with general appropriation support. The WLIP's funding mechanism, which is a land-related documents recording fee collected by each County Register of Deeds, has generated over \$70 million statewide since 1991. The benefits of Wisconsin's program are numerous and include 1) land records modernization, 2) accelerated local government GI/GIT activities, 3) leveraging of federal funds, 4) reduction of title insurance costs, and 5) economic development (including the creation and expansion of consulting and software development firms).

In the case of Wisconsin, many strong proponents in academia worked successfully with practitioners to achieve success. A key aspect of the program is that much of the funding is retained by the counties who collect the fees, only a small portion is distributed back to the State. This provision was necessary to garner support from local officials. However, because little of the funding is actually used for statewide data, the State now faces the serious challenges of linking up all the county systems to help form a statewide data foundation.

In 2000 Oregon's legislature authorized the addition of a \$1.00 fee to each land transfer to help develop a statewide property tax map. While not included in this analysis, Vermont is the only other state known to have used such fees to help support statewide GI/GIT coordination. Recently (2001), the Illinois legislature authorized counties to adopt a fee structure for filing documents with the funds used strictly for GIS implementation and maintenance.

Some states have built upon the Wisconsin Land Information Program model, incorporating lessons learned from the local-state cost share. Montana is now considering passage of the Montana Land Information Act, which institutes a \$1.00 record copying fee to be used strictly for GIS implementation and maintenance.

To ensure statewide goals are met for integrating local data into a statewide data framework, IGIC recommends the funds be shared: 25% retained locally, and 75% to the state to fund statewide data and projects at state, local and universities.

## **TIMING**

The State of Indiana is well positioned to take advantage of new opportunities for statewide GIS. Funding from 2003 and 2004 homeland security grants is in hand to kick-start this effort. If a GIS Technology Strategy is established now, we will stay on track. A funding stream set into motion during 2005 will be perfectly aligned for 2006 and 2007 data maintenance efforts on orthophotography and other framework and critical infrastructure data.

Local, state and federal agencies must be able to accommodate program cost-share opportunities in their budgets (there must be enough lead time and confidence that state funding is there).

*For more information about the contents of this document, or GIS in general, please contact the Indiana Geographic Information Council, Executive Director Jill Saligoe-Simmel, [jsaligoe@iupui.edu](mailto:jsaligoe@iupui.edu).*

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